

WHAT IS CLAIMED IS:

1. A method of mirroring data transfer commands in a network, the network including a SCSI initiator and a plurality of SCSI targets, the initiator and targets all being connected to a TCP/IP network, comprising the steps of:

(a) transmitting, from the initiator, a registration command via the TCP/IP network, to each target of the plurality of targets, the registration command including a multicast address and a virtual logical unit number;

(b) establishing a mapping, responsive to the registration command, at each of the SCSI devices, indicating an association between the SCSI device and the virtual logical unit number and the multicast address;

(c) transmitting, from the initiator, a SCSI data transfer command, the SCSI data transfer command indicating the multicast group address;

(d) receiving, at each of the members of the multicast group, the data transfer command, and transferring data in response thereto;

(e) executing, in each of the SCSI members of the multicast group, the specified data transfer command.

2. The method of claim 1, further comprising the step of:

(f) transmitting, from the initiator, to each target of the plurality of targets, a mirroring termination command.

3. The method of claim 2, wherein the mirroring termination command causes a disassociation from the virtual logical unit number.

4. The method of claim 2, wherein the mirroring termination command causes a disassociation from the multicast group.

5. The method of claim 1, wherein the data transfer command is a WRITE command.
6. The method of claim 5, wherein the WRITE command specifies the virtual logical unit number.
7. The method of claim 5, wherein there are a plurality of WRITE commands.
8. The method of claim 1, wherein the registration command is transmitted to a unicast address corresponding to each target of the plurality of targets.
9. The method of claim 1, wherein the registration command has a standard SCSI text command format.
10. The method of claim 1, wherein each target of the plurality of targets responds to the registration command by setting a communication NIC to listen on the multicast address; and by mapping the virtual logical unit number to the SCSI device.
11. The method of claim 1, wherein, upon establishing the mapping, each target of the plurality of targets returns a message to the initiator
12. The method of claim 1, wherein the data transfer command is transmitted via a multicast.
13. The method of claim 1, wherein each of the SCSI members of the multicast group returns a status of the data transfer command, and wherein the initiator handles any error status of the data transfer command.
14. The method of claim 2, wherein each target of the plurality of targets returns, to the initiator, a status indicating completion of the mirroring termination command.
15. A method of mirroring data transfer commands in a network, the network including a SCSI initiator and a plurality of SCSI targets, the initiator and targets all being connected to a TCP/IP network, comprising the steps of:

(a) transmitting, from the initiator, a registration command via the TCP/IP network, to each target of the plurality of targets, the registration command including a multicast address and a virtual logical unit number, wherein the registration command is transmitted to a unicast address corresponding to each target of the plurality of targets, wherein the registration command has a standard SCSI text command format, and wherein each target of the plurality of targets responds to the registration command by setting a communication NIC to listen on the multicast address; and by mapping the virtual logical unit number to the SCSI device;

(b) establishing a mapping, responsive to the registration command, at each of the SCSI devices, indicating an association between the SCSI device and the virtual logical unit number and the multicast address;

(c) transmitting, from the initiator, a SCSI data transfer command, the SCSI data transfer command indicating the multicast group address, wherein the data transfer command is a WRITE command, and wherein the WRITE command specifies the virtual logical unit number;

(d) receiving, at each of the members of the multicast group, the data transfer command, and transferring data in response thereto;

(e) executing, in each of the SCSI members of the multicast group, the specified data transfer command; and

(f) transmitting, from the initiator, to each target of the plurality of targets, a mirroring termination command, wherein the mirroring termination command causes a disassociation from the virtual logical unit number.

16. A system for mirroring data transfer commands in a network, the network including a SCSI initiator and a plurality of SCSI targets, the initiator and targets all being connected to a TCP/IP network, comprising:

(a) a registration command, transmitted from the initiator via the TCP/IP network, to each target of the plurality of targets, the registration command including a multicast address and a virtual logical unit number;

(b) a mapping, established responsive to the registration command, at each of the SCSI devices, indicating an association between the SCSI device and the virtual logical unit number and the multicast address;

(c) a SCSI data transfer command, transmitted from the initiator, the SCSI data transfer command indicating the multicast group address; and

(d) at each of the members of the multicast group, responsive to reception of the data transfer command, a transfer of data..

17. The system of claim 16, further comprising:

(f) a mirroring termination command, transmitted, from the initiator, to each target of the plurality of targets.

18. The system of claim 17, wherein the mirroring termination command causes a disassociation from the virtual logical unit number.

19. The system of claim 17, wherein the mirroring termination command causes a disassociation from the multicast group.

20. The system of claim 16, wherein the data transfer command is a WRITE command.

21. The system of claim 20, wherein the WRITE command specifies the virtual logical unit number.

22. The system of claim 20, wherein there are a plurality of WRITE commands.

23. The system of claim 16, wherein the registration command is transmitted to a unicast address corresponding to each target of the plurality of targets.

24. The system of claim 16, wherein the registration command has a standard SCSI text command format.

25. The system of claim 16, wherein each target of the plurality of targets responds to the registration command by setting a communication NIC to listen on the multicast address; and by mapping the virtual logical unit number to the SCSI device.

26. The system of claim 16, wherein, upon establishing the mapping, each target of the plurality of targets returns a message to the initiator

27. The system of claim 16, wherein the data transfer command is transmitted via a multicast.

28. The system of claim 16, wherein each of the SCSI members of the multicast group returns a status of the data transfer command, and wherein the initiator handles any error status of the data transfer command.

29. The system of claim 17, wherein each target of the plurality of targets returns, to the initiator, a status indicating completion of the mirroring termination command.

30. The system of claim 16, wherein each command is embodied as an electronic signal.

31. A system of mirroring data transfer commands in a network, the network including a SCSI initiator and a plurality of SCSI targets, the initiator and targets all being connected to a TCP/IP network, comprising:

(a) a registration command transmitted from the initiator via the TCP/IP network, to each target of the plurality of targets, the registration command including a multicast address and a virtual logical unit number, wherein the registration command is transmitted to a unicast address corresponding to each target of the plurality of targets, wherein the registration command has a standard SCSI text command format, and wherein each target of the plurality of

targets responds to the registration command by setting a communication NIC to listen on the multicast address; and by mapping the virtual logical unit number to the SCSI device;

(b) a mapping, established responsive to the registration command, at each of the SCSI devices, indicating an association between the SCSI device and the virtual logical unit number and the multicast address;

(c) a SCSI data transfer command, transmitted from the initiator, the SCSI data transfer command indicating the multicast group address, wherein the data transfer command is a WRITE command, and wherein the WRITE command specifies the virtual logical unit number;

(d) at each of the members of the multicast group, a received data transfer command, and transferring data in response theret; and

(e) a mirroring termination command transmitted from the initiator to each target of the plurality of targets, wherein the mirroring termination command causes a disassociation from the virtual logical unit number.

32. A system of for mirroring data transfer commands in a network, the network including a SCSI initiator and a plurality of SCSI targets, the initiator and targets all being connected to a TCP/IP network, comprising:

(a) means for transmitting, from the initiator, a registration command via the TCP/IP network, to each target of the plurality of targets, the registration command including a multicast address and a virtual logical unit number;

(b) means for establishing a mapping, responsive to the registration command, at each of the SCSI devices, indicating an association between the SCSI device and the virtual logical unit number and the multicast address;

(c) means for transmitting, from the initiator, a SCSI data transfer command, the SCSI data transfer command indicating the multicast group address;

(d) means for receiving, at each of the members of the multicast group, the data transfer command, and transferring data in response thereto; and

(e) means for executing, in each of the SCSI members of the multicast group, the specified data transfer command.

33. The system of claim 32, further comprising:

(f) means for transmitting, from the initiator, to each target of the plurality of targets, a mirroring termination command.

34. The system of claim 33, wherein the mirroring termination command causes a disassociation from the virtual logical unit number.

35. The system of claim 33, wherein the mirroring termination command causes a disassociation from the multicast group.

36. The system of claim 32, wherein the data transfer command is a WRITE command.

37. The system of claim 36, wherein the WRITE command specifies the virtual logical unit number.

38. The system of claim 36, wherein there are a plurality of WRITE commands.

39. The system of claim 32, wherein the registration command is transmitted to a unicast address corresponding to each target of the plurality of targets.

40. The system of claim 32, wherein the registration command has a standard SCSI text command format.

41. The system of claim 32, wherein each target of the plurality of targets responds to the registration command by setting a communication NIC to listen on the multicast address; and by mapping the virtual logical unit number to the SCSI device.

42. The system of claim 32, wherein, upon establishing the mapping, each target of the plurality of targets returns a message to the initiator.

43. The system of claim 32, wherein the data transfer command is transmitted via a multicast.

44. The system of claim 32, wherein each of the SCSI members of the multicast group returns a status of the data transfer command, and wherein the initiator handles any error status of the data transfer command.

45. The system of claim 33, wherein each target of the plurality of targets returns, to the initiator, a status indicating completion of the mirroring termination command.

46. A system for mirroring data transfer commands in a network, the network including a SCSI initiator and a plurality of SCSI targets, the initiator and targets all being connected to a TCP/IP network, comprising:

(a) means for transmitting, from the initiator, a registration command via the TCP/IP network, to each target of the plurality of targets, the registration command including a multicast address and a virtual logical unit number, wherein the registration command is transmitted to a unicast address corresponding to each target of the plurality of targets, wherein the registration command has a standard SCSI text command format, and wherein each target of the plurality of targets responds to the registration command by setting a communication NIC to listen on the multicast address; and by mapping the virtual logical unit number to the SCSI device;

(b) means for establishing a mapping, responsive to the registration command, at each of the SCSI devices, indicating an association between the SCSI device and the virtual logical unit number and the multicast address;

(c) means for transmitting, from the initiator, a SCSI data transfer command, the SCSI data transfer command indicating the multicast group address, wherein the data transfer



